

## Limit State Evaluation of Bridge According to Peak Ground Acceleration

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**Abstract :** In the past, the criteria and procedures for the design of concrete structures were mainly based on the stresses allowed for structural components. However, although the frequency of earthquakes has increased and the risk has increased recently, it has been difficult to determine the safety factor for earthquakes in the safety assessment of structures based on allowable stresses. Recently, limit state design method has been introduced for reinforced concrete structures, and limit state-based approach has been recognized as a more effective technique for seismic design. Therefore, in this study, the limit state of the bridge, which is a structure requiring higher stability against earthquakes, was evaluated. The finite element program LS-DYNA and twenty ground motion were used for time history analysis. The fracture caused by tensile and compression of the pier were set to the limit state. In the concrete tensile fracture, the limit state arrival rate was 100% at peak ground acceleration 0.4g. In the concrete compression fracture, the limit state arrival rate was 100% at peak ground acceleration 0.2g.

**Keywords :** allowable stress, limit state, safety factor, peak ground acceleration

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